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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,394	03/15/2004	Ozgur Sahin	STF-S02-045	1677

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EXAMINER

RAEVIS, ROBERT R

ART UNIT PAPER NUMBER

2856

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/801,394

Applicant(s)

SAHIN ET AL.

Examiner

Robert R. Raevis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 32-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/04, 12/20</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

Claims 1-4,6,8,10,11,30,12,13,23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission in view of Bagley et al

Applicants describe (Figures 1,2; and pages 1-3) an AFM that employs a cantilever that is vibrated "close to one of its flexural resonances, typically the fundamental resonance frequency" (p. 2, lines 8-12); but does not refer to an "integer number", or clearly state that that shape is "selected" to tune the fundamental frequency.

As to claims 1-4,6,8,10,11,30,12,13,23-29, it would have been obvious that Applicant's described cantilever has a shape that provides for higher resonant frequencies being an integer multiple of a first resonant frequency as Bagley teaches (col. 1, lines 30-35) that cantilevers retain an "integer multiple" (col. 1, line 32) relationship. In addition, it would have been obvious to select a shape for a cantilever in an AFM as AFM's generally employ a long and narrow cantilevers to provide for accurate surface measuring.

As to claims 6,8,10,11,30,12,13,23-29, it would have been obvious to employ a diamond coating material for Applicant's tip as diamond coatings are known in AFM to allow for a more durable tip. Adding a coating necessarily changes a dimension/mass of the arm.

Claims 5,31,15-17,19,21,22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission in view of Bagley et al as called for in claim 4, and further in view of Fretigny et al.

As to claims 5,31,15-17,19,21,22 it would have been obvious it would have been obvious to employ a tapered/V shaped cantilever end region with hole in the cantilever as Fretigny teaches (Figure 3) use of a tapered shape cantilever 2 to provide for a sensitive holder for an AFM tip 1.

Claims 7,9,11,30,12-14,11,15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission in view of Bagley et al as applied against claim 6 above, and further in view of Kirk et al.

As to claims 11,15-22, it would have been obvious to employ notches on Sahin's cantilever as Kirk et al teach (Figure 10) use of notches 91 to control the level of bending of cantilevers in scanning probe microscopes.

As to claims 7,9,11,30,12-15-17, it would have been obvious to employ a region of reduced dimensions as Kirk et al teach (col. 11, lines 8-31) use of etching to reduce dimensions/mass of a cantilever to vary sensitivity of a cantilever probe.

Regarding Applicant's REMARKS, consider the following:

As to p. 12; Bagley expresses that a "cantilever beam" (col. 1, line 17) has a "higher resonant frequency typically being an integer multiple of a first resonant frequency" (lines 31-33). Also, note that Applicant's Figures 1 and 2 present a "cantilever beam".

As to p. 13, top 10 lines; Bagley's comment about actual resonant frequencies is directed to plates, not beams.

As to p. 13, lines 7-8 from bottom of the page; the area of the art is simple a "cantilever". It is the *structure* of apparatus claims that must be distinguished over the

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prior art. The claim is directed to just a cantilever, pages 1-3 (of the specification) are directed to a cantilever, and the portion of Bagley applied against Applicant's claim is directed to a cantilever. Claim 1 is not limited to an atomic force microscope. Even the claim language ("for use in" (line 1), and "is to be used" (line 7) suggests that the claimed cantilever is not coupled to any structure that would limit the claimed apparatus to an atomic force microscope.

As to p. 14, lines 1-2; Bagley expresses that a "cantilever beam" (col. 1, line 17) has a "higher resonant frequency typically being an integer multiple of a first resonant frequency" (lines 31-33).

As to p. 14, last paragraph (that continues on to p. 15); the claim is directed to a cantilever, and not an imager. Thus, the "purpose" (line 5 from bottom of p. 14) does not seem to be part of the claim in any case.

As to p. 15, lines 3-4 from bottom; see Bagley.

Please cancel non-elected claims in any response to this final action.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert R. Raevis whose telephone number is 571-272-2204. The examiner can normally be reached on Monday to Friday from 6:30am to 4pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Robert R. Raevis*

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